

H. BIRKHOLZ.

APPARATUS FOR CASTING CHILLED CORRUGATED ROLLERS.

No. 404,889.

Patented June 11, 1889.

Fig. 1.

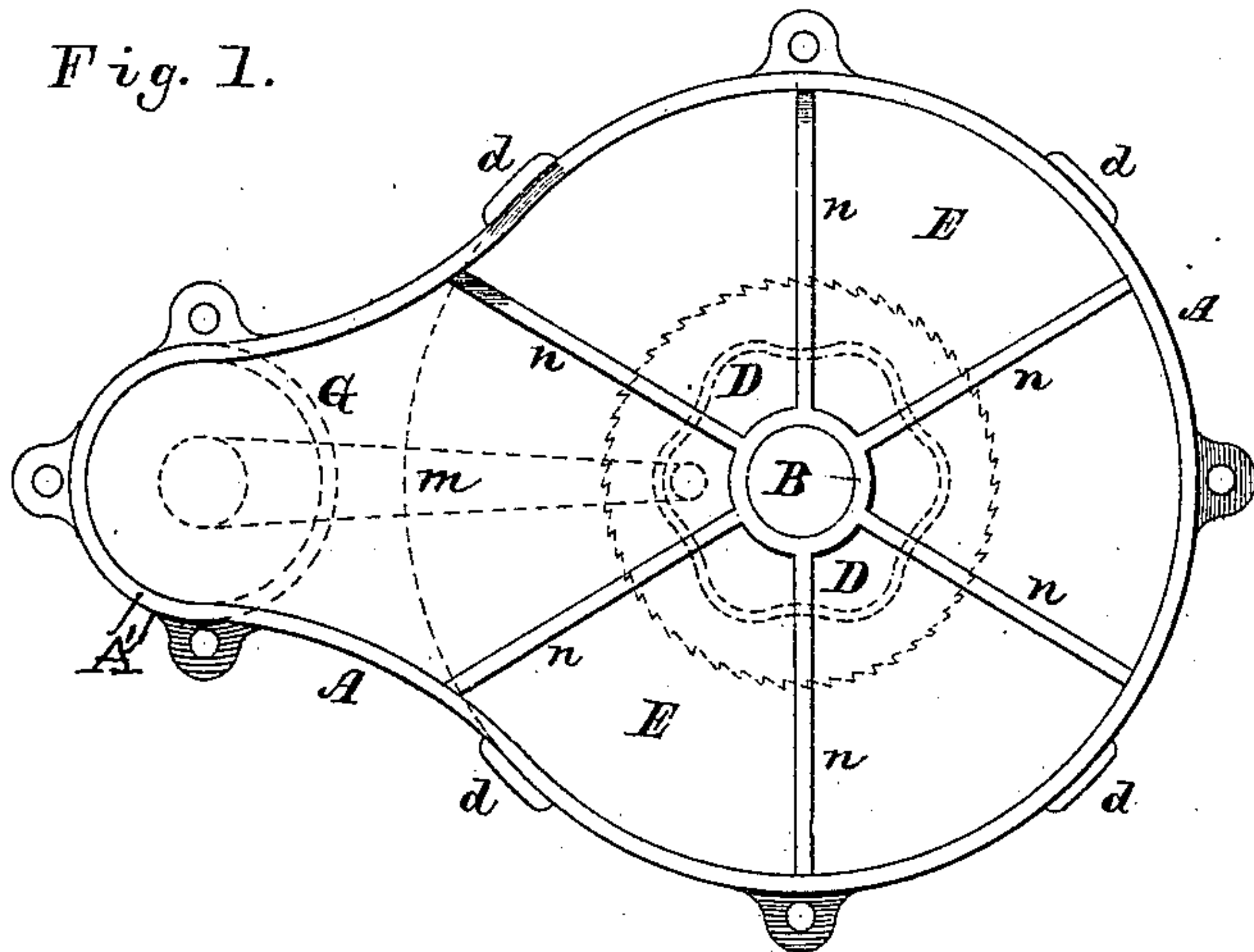


Fig. 2.

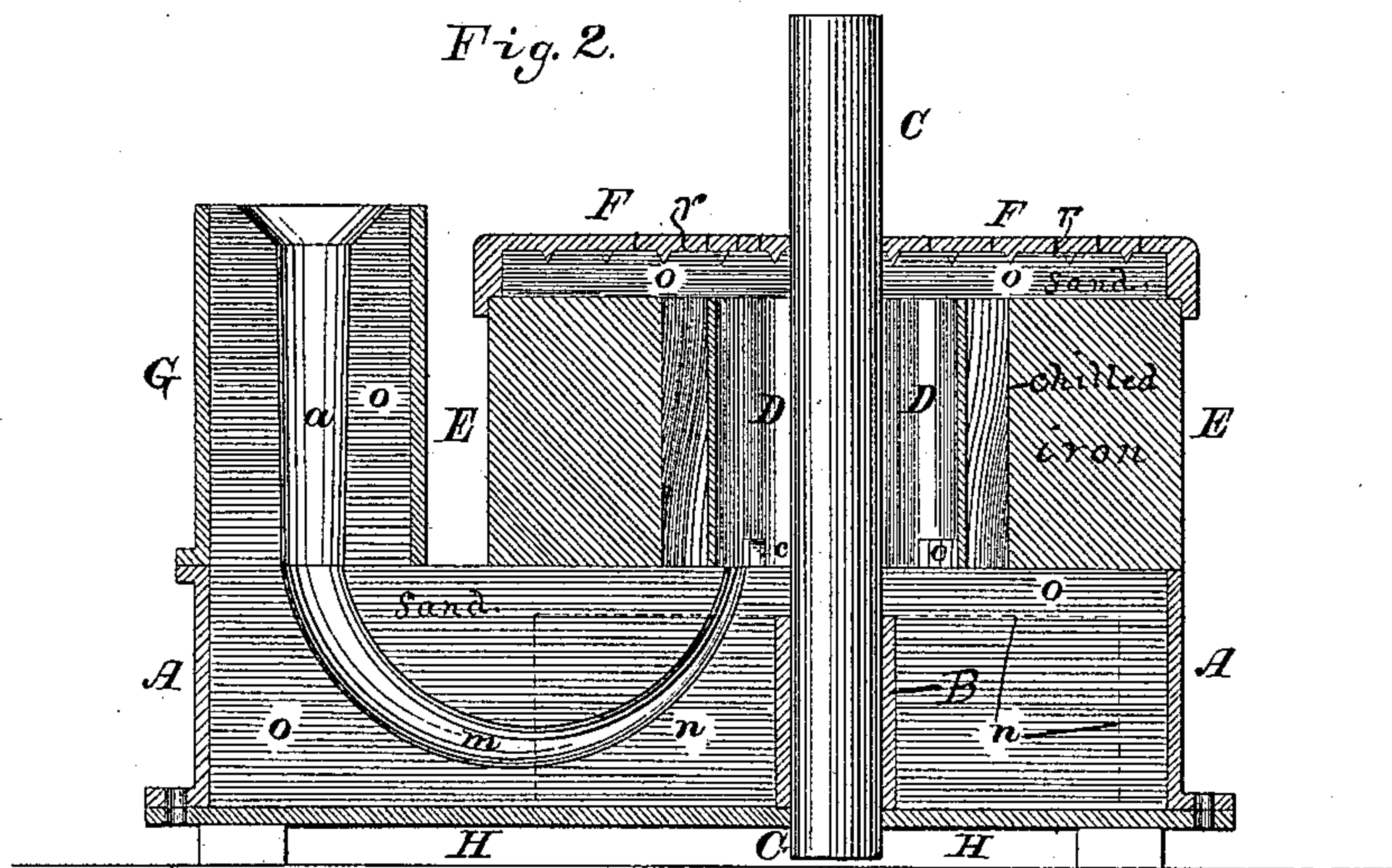
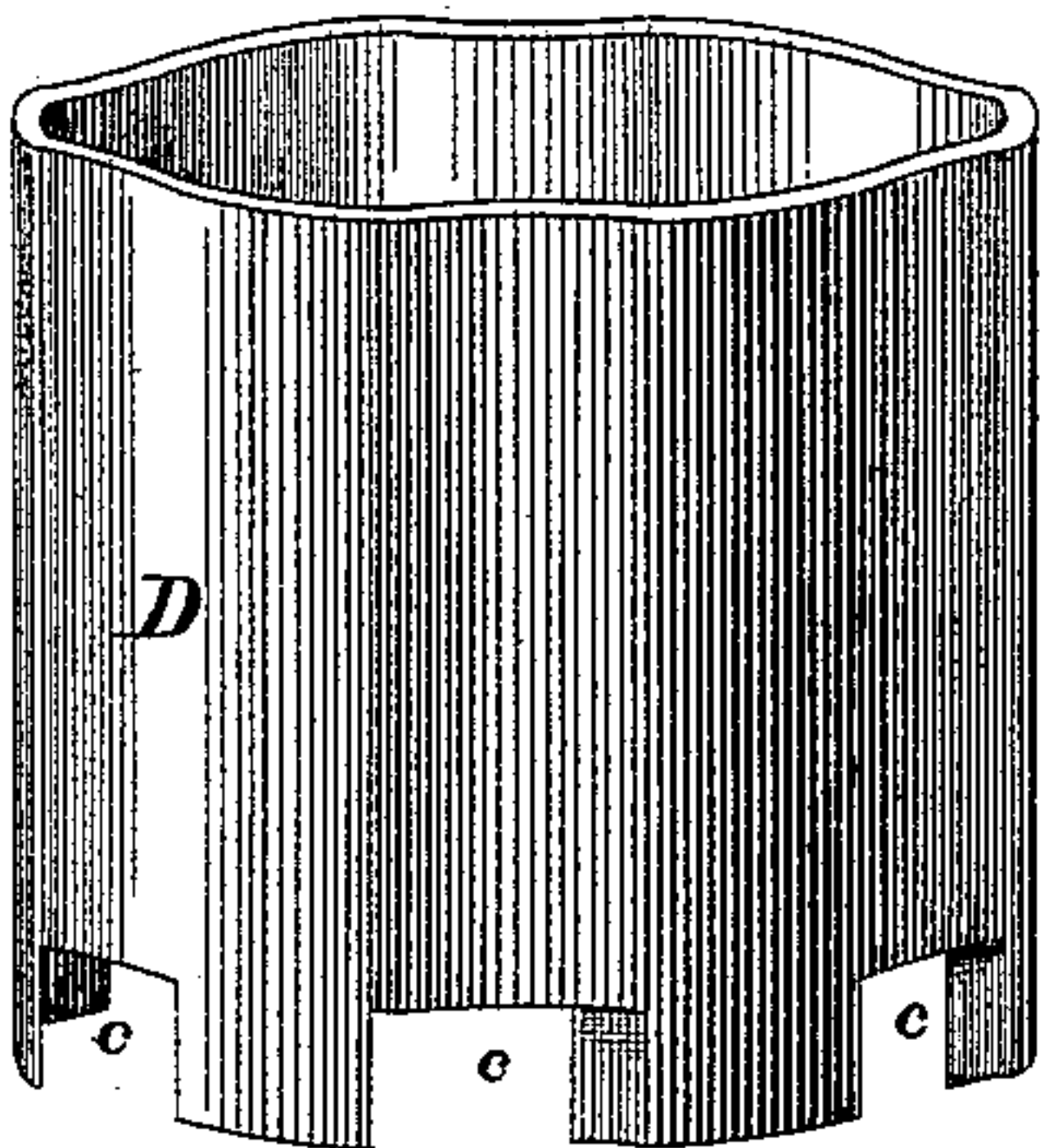


Fig. 3.



Witnesses:

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

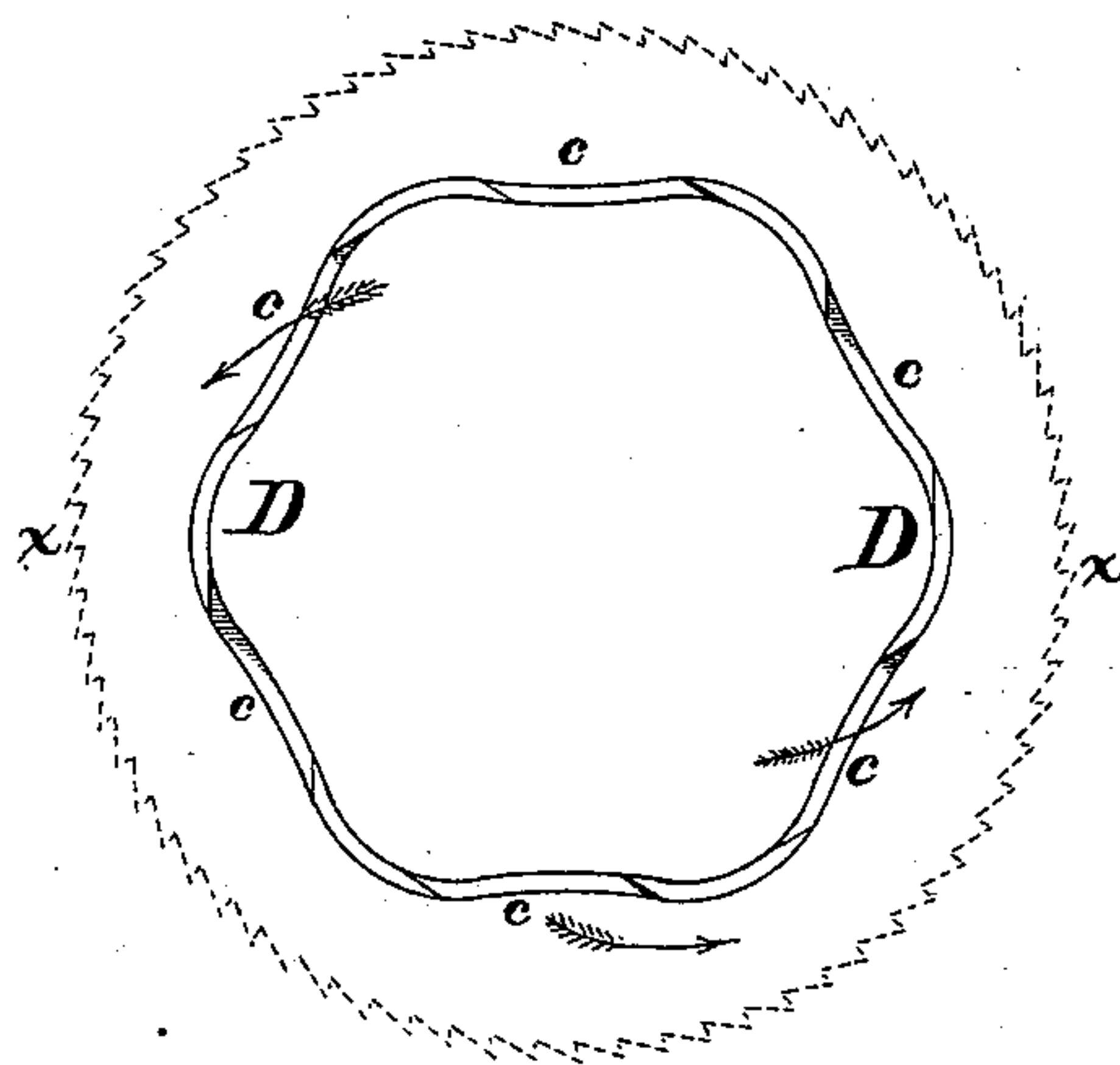
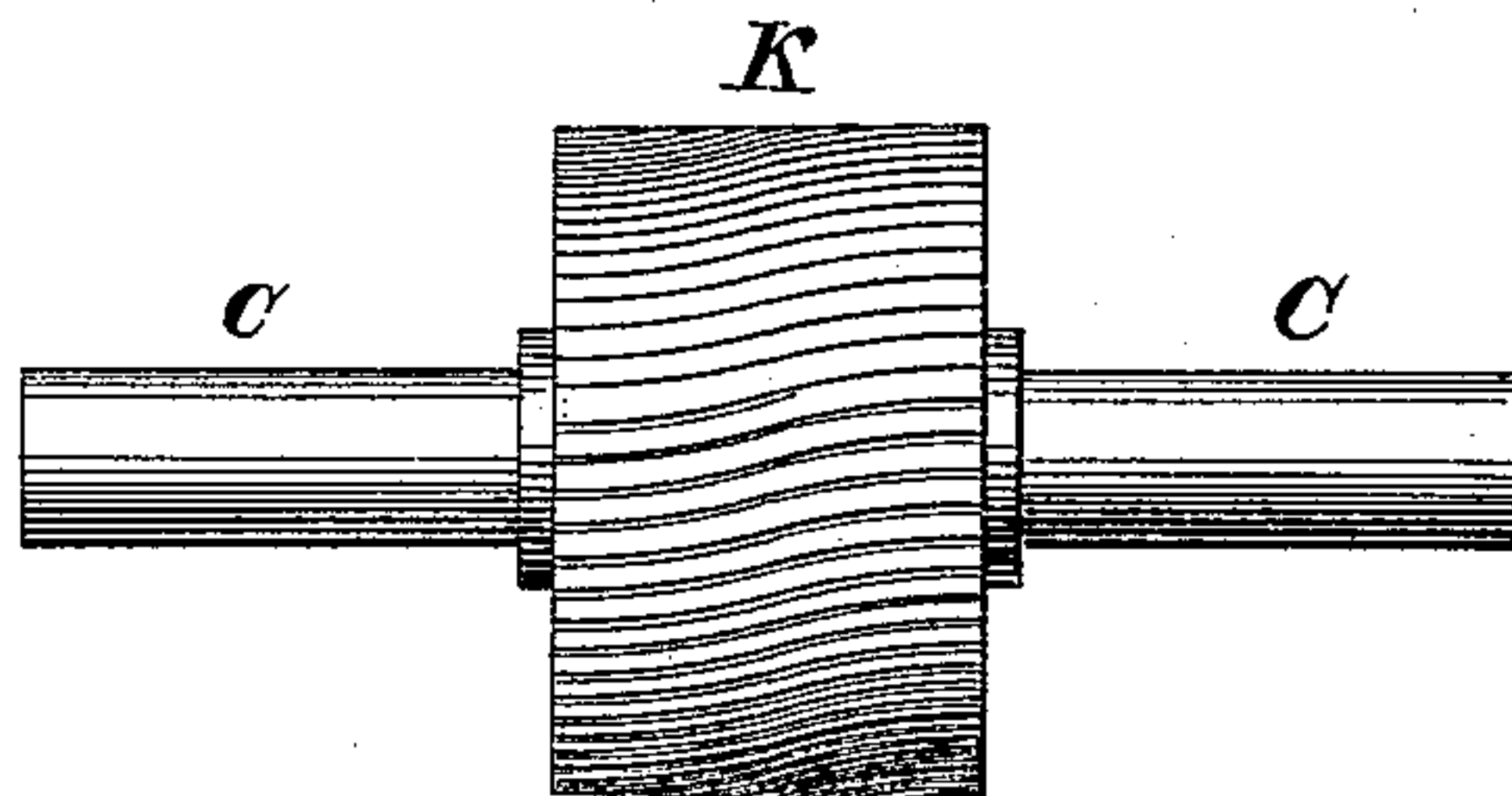


Fig. 5.



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UNITED STATES PATENT OFFICE.

HANS BIRKHOLZ, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO EDWARD P. ALLIS, OF SAME PLACE.

APPARATUS FOR CASTING CHILLED CORRUGATED ROLLERS.

SPECIFICATION forming part of Letters Patent No. 404,889, dated June 11, 1889.

Application filed April 22, 1884. Serial No. 128,884. (No model.)

To all whom it may concern:

Be it known that I, HANS BIRKHOLZ, of the city and county of Milwaukee, and State of Wisconsin, have invented certain new and
5 useful Improvements in an Apparatus for Casting Corrugated Rollers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention consists, essentially, of an
15 improved mold or apparatus for casting chilled corrugated rollers. Its object is to produce at one operation an iron roll with hardened corrugations free from flaws and defects.

In the accompanying drawings like letters
20 refer to the same parts throughout the several figures.

Figure 1 is a plan view of the flask used for casting the roll, showing by dotted lines the relative positions of the chill ring or mold and
25 the fluted cylinder. Fig. 2 is a vertical medial section of the flask, cylinder, and chill-ring prepared to receive the melted iron. Fig. 3 is a perspective view, on an enlarged scale, of the fluted cylinder. Fig. 4 is a view, on an
30 enlarged scale, of the bottom of said cylinder, showing its tangential openings, and by the dotted line *x x* its position with reference to the chill ring or mold; and Fig. 5 shows a finished spirally-corrugated chilled-iron roll
35 cast by my improved process.

A A represents an iron flask made in the general form of a cylinder of the same diameter as the chill ring or mold and having a small cylindrical extension on one side to al-
40 low for the gate through which the mold is filled.

The flask A has at the center of its large portion a small cylindrical opening or sleeve B to receive and hold in position the shaft or
45 axle C, about which the roll is to be cast.

n n n are brace partitions or wings radiating from the central sleeve B to the outer walls of the flask.

d d are lugs raised about the periphery of
50 the flask to hold the chill-ring E, which sits upon its upper edge in position.

H H is a bed-plate, to which the flask A is securely fastened.

To prepare the mold for use, the flask A is filled with molding-sand *o o*, the shaft C C
55 having first been set in the sleeve B, and a horn-shaped piece of wood having been placed so as to form the segmental portion *m* of the gate which opens at its smaller end just in-
60 side of the fluted cylinder D, as shown in Figs. 1 and 2, while the larger end opens upward at the center of the small cylindrical extension. The sand is tamped closely about the shaft C, above the sleeve B, which, together with the
65 radial wings *n n*, is made considerably lower than the outer walls of the flask, as seen in Fig. 2, so as to be entirely covered with the sand. After the flask has been filled with sand flush with its outer walls the chill ring
70 or mold E E is set thereon in the position shown in broken lines in Figs. 1 and 2.

D D is a fluted iron cylinder provided at the bottom with the tangential openings *c c c*, which is placed about the shaft C, inside of the chill-
75 ring E E, as shown in Figs. 1, 2, and 4. The chill-ring E, with the fluted cylinder D, is then covered with the cap-plate F F, which has been previously filled with sand *o o*, as seen in Fig. 2.

The cap-plate F F has a flange about its pe-
80 riphery which fits about the edge of the chill-ring E and holds it in place. It is also provided with a central perforation to receive the shaft C and assist in holding the same in its exact central position. A number of small
85 holes *r* therein permit the gases generated by the hot iron and the moisture of the sand to escape.

G is a small hollow cylinder, which is filled with sand and provided with the tunnel-
90 shaped opening *a*, the lower end of which meets the opening of the horn-shaped passage *m*, with which it forms a continuous gate through which the melted metal is poured
95 into the mold.

The cylinder G is of the same diameter as the cylindrical extension A' of the flask A, and when in position rests upon the upper edge thereof and rises a little above the top
100 of the chill-ring E.

When the mold has been prepared and arranged as described, the melted metal is

poured into the same through the gate *a m* and rises within the fluted ring *D* above the openings *c c c*. The lighter impurities in the iron will rise to the surface above the openings, where they will be held, while the heavier and purer metal below rushes out through the tangential openings *c c* and fills the mold outside of the ring *D*. By cutting the openings *c c* on the receding curves of the fluted ring tangential to its general circumference the direction indicated by the arrows in Fig. 4 is given to the metal as it rushes through them, and in this way the serrate grooves shown by the dotted line *x x* will be effectually filled and sharp corrugations formed upon the roll. As the mold is filled the thin fluted ring *D D* melts into the substance of the roll which is formed about the shaft *C* and shrinks in cooling snugly around it. The roll *K* is then driven out of the chill-ring *E* and the rough ends turned down smooth, as seen in Fig. 5. The corrugations may then, if desired, be trimmed off even upon an emery-wheel.

The mold or apparatus for casting the chill-ring *E*, I make the subject of a separate application for Letters Patent of the United States bearing even date herewith.

I claim—

1. In a mold for casting corrugated rollers, the combination of an internally-corrugated chill-ring, a gate opening on the outside above said mold and into the bottom of the same near the center, and a cylinder having oblique openings placed within said mold about its axis and the internal opening of said gate, substantially as and for the purposes set forth.

2. In a mold for casting corrugated rollers, the combination of an internally-corrugated chill-ring, a gate opening on the outside above said mold and into the bottom of the same near the center, and a fluted cylinder having oblique openings placed within said mold about its axis, and the internal opening of said gate, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HANS BIRKHOLZ.

Witnesses:

CHAS. L. GOSS,
GEORGE GOLL.